

Sony International (Europe) GmbH
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Claims

1. Demodulation structure for downconverting and demodulating a digitally modulated signal (S_0), with
 a local oscillator means (1, 5, 8) for providing a local oscillator signal (S_{lo}),
 10 a mixer means (2) for mixing said local oscillator signal (S_{lo}) and said digitally modulated signal (S_0) in order to obtain a mixed signal,
 a low pass filter means (3) for low pass filtering said mixed signal from said mixer means (2), and
 an analog-to-digital converting means (4) for converting the filtered signal from said
 15 low pass filter means (3) into a downconverted and demodulated digital signal (S_1),
 whereby said local oscillator signal is set in respect to said modulated digital signal so that said downconverted and demodulated digital signal (S_1) output from said analog-to-digital converting means comprises two serially arranged information parts.
- 20 2. Demodulation structure according to claim 1,
characterized in,
 that said digitally modulated signal (S_0) is I/Q-modulated and said two serially arranged information parts comprised in said downconverted and demodulated digital signal (S_1) are an I-part and a Q-part of the I/Q-modulated digital signal.
- 25 3. Demodulation structure according to claim 1 ~~or 2~~,
characterized in,
 that said digitally modulated signal (S_0) is modulated in a signal band having a center frequency (f_c) and said local oscillator signal has a center frequency (f_{lo}), which is, in
 30 respect to said center frequency (f_c) of the signal band, offset by half of the signal band width of the modulated digital signal (S_0).
4. Demodulation structure according to claim 1 ~~or 2~~,
characterized in,

that said local oscillator signal (S_{lo}) is modulated with at least two modulation states having different phases during the symbol period of the modulated digital signal (S_0).

5. Demodulation structure according to claim 4,

5 **characterized in,**

that said two different modulation states have the same magnitude and a 90 degree phase shift in respect to each other.

6. Demodulation structure according to claim 4 ~~or~~ 5,

10 **characterized by**

a modulation control means (7) for supplying a modulation signal to said local oscillator means (5) in order to internally modulate the local oscillator signal (S_{lo}) with said two modulation states.

15 7. Demodulation structure according to claim 4 ~~or~~ 5,

characterized by

an analog circuit means for modulating said local oscillator signal from said local oscillator means with said two modulation states and outputting a modulated local oscillator signal to said mixer means.

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8. Demodulation structure according to claim 7,

characterized in,

that said analog circuit means (9) comprises a switch means (10) which can be switched between a first branch (12) having a phase shift means (11) and a second branch (13) having no phase shift means, whereby said switch means is switched by means of a control signal with a frequency of two times the symbol frequency of the modulated digital signal.

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9. Demodulation structure according to one of the claims ~~4 to 8~~,^L

30 **characterized by**

a band pass filter (6) for band pass filtering said modulated local oscillator signal (S_{lo}).

10. Demodulation structure according to claim 9,
characterized in,

that said band pass filter (6) has a center frequency corresponding to the center frequency (f_c) and a bandwidth corresponding to the bandwidth of the signal band of the modulated digital signal.

11. Method for downconverting and demodulating a digitally modulated signal (S_0), with the steps of
 providing a local oscillator signal (S_{lo}),
 10 mixing said local oscillator signal (S_{lo}) and said digitally modulated signal (S_0) in order to obtain a mixed signal,
 low pass filtering said mixed signal, and
 analog-to-digital converting the filtered signal into a downconverted and demodulated digital signal (S_1),
 15 whereby said local oscillator signal (S_{lo}) is set in respect to said modulated digital signal (S_0) so that said downconverted and demodulated digital signal (S_1) comprises two serially arranged information parts.

12. Method according to claim 11,
 20 **characterized in,**
 that said digitally modulated signal (S_0) is I/Q-modulated and said two serially arranged information parts comprised in said downconverted and demodulated digital signal (S_1) are an I-part and a Q-part of the I/Q-modulated digital signal.

- 25 13. Method according to claim 11 or 12,
characterized in,
 that said digitally modulated signal (S_0) is modulated in a signal band having a center frequency (f_c) and said local oscillator signal (S_{lo}) has a center frequency (f_{lo}), which is, in respect to said center frequency (f_c) of the signal band, offset by half of the signal
 30 band width of the modulated digital signal (S_0).

14. Method according to claim 11 or 12,

characterized in,

that said local oscillator signal (S_{lo}) is modulated with at least two modulation states having different phases during the symbol period of the modulated digital signal (S_0).

5 15. Method according to claim 14,

characterized in,

that said two different modulation states have the same magnitude and a 90 degree phase shift in respect to each other.

10 16. Method according to claim 14 ~~or 15~~,

characterized by

internally modulating the local oscillator signal (S_{lo}) with said two modulation states by means of a supplied modulation signal.

15 17. Method according to claim 14 ~~or 15~~,

characterized by

externally modulating said local oscillator signal (S_{lo}) with said two modulation states and outputting a modulated local oscillator signal to said mixing step.

20 18. Method according to claim 17,

characterized in,

that said local oscillator signal (S_{lo}) is switched between a phase shift state and a no phase shift state by means of a control signal with a frequency of at least two times the symbol frequency of the modulated digital signal.

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19. Method according to ~~one of the claims 14 to 18~~,

characterized by

band pass filtering said modulated local oscillator signal (S_{lo}).

30 20. Method according to claim 19,

characterized in,

that said band pass filtering step uses a center frequency corresponding to the center frequency f_c and a bandwidth corresponding to the bandwidth of the signal band of the modulated digital signal.